

XCLAIM™ GA

User's Guide

Version 2.0 - October 1995

P/N: 10701M0120

© Copyright 1995, by ATI Technologies Inc.

ATI, *mach64*, and XCLAIM are trademarks and/or registered trademarks of ATI Technologies Inc. All other company and/or product names are trademarks and/or registered trademarks of their respective manufacturers. Pricing, availability, features, and performance and specifications are subject to change without notice. Product may not be exactly as shown in the diagrams.

All rights reserved, including those to reproduce this manual or parts thereof, in any form without the express written permission of ATI Technologies Inc.

Printed in Canada 95 10

P/N: 10701M0120

Disclaimer

While every precaution has been taken in the preparation of this document, ATI Technologies Inc. assumes no liability to any party for errors or omissions contained in the Software or related documentation, any interruption of service, loss or interruption of business or anticipatory profits or for incidental or consequential damages in connection with the furnishing, performance, or use of the Software and related documentation.

ATI Technologies Inc. reserves the right to make changes without further notice to a product or system described herein to improve reliability, function, or design.



Table of Contents

1. Getting Started	1
Introduction	1
What's in the Package	2
What You'll Need	2
Related Documentation	2
2. Installing Your Card	3
About Monitor Sensing	8
3. Installing Your Software	9
About ATI Software	9
Installing Software	10
ATI Displays Control Panel	10
Multiple Displays	12
Popup Menu	12
ATI Guide	13
Balloon Help	13
A. Video Modes	15
Memory Upgrade	16
B. Specifications	17
C. Troubleshooting Tips	19
Before Contacting Customer Support	19
Solutions to Common Problems	19
D. FCC Compliance Statement	23
DOC Compliance Statement	24



Getting Started

Introduction

CONGRATULATIONS! You have just purchased one of the most advanced 64-bit graphics acceleration technologies available on the market today, from the award winning graphics leader ATI Technologies Inc.

The XCLAIM GA is the ultimate solution for the graphics professional. By combining ATI's advanced *mach64* graphics chip with a PCI local bus, your Power Macintosh virtually eliminates the time delay of processing intense computer graphics.

The 4MB VRAM configuration supports resolutions up to 1600x1200, or 16.7 million colors at 1152x870 resolution. The 2MB VRAM configuration supports resolutions up to 1600x1200, or 16.7 million colors at 832x624 resolution. Refresh rates up to 75Hz are supported for all resolutions and color depths. Other key features include both Apple and VGA monitor connectors, as well as extensive software utilities allowing you to directly control and modify your desktop environment dynamically.

What does all this technology mean to you? Superior application performance — by reducing the main processor work load in the graphics equation, and taking advantage of the “wicked fast” PCI local bus.

Before you install your new card, please read this manual thoroughly. It contains important information on installing and operating your XCLAIM GA.

What's in the Package

The XCLAIM GA package contains the following hardware, software, and documentation:

- XCLAIM GA card
- 3.5" installation disk
- This User's Guide

If any item is missing or damaged, immediately contact the dealer from whom the unit was purchased.

What You'll Need

The XCLAIM GA card runs with the following minimum system requirements:


- Power Macintosh with a PCI expansion slot
- Macintosh System software 7.5.2 or higher
- Any Apple monitor or VGA monitor supporting a minimum resolution of 640x480

Related Documentation

The README file summarizes the latest product revisions. Click the ReadMe icon on the installation disk to open this file.

The XCLAIM GA card comes with ATI Guide which provides online help for configuring your card. Please refer to the ATI Guide to get information on the following topics:

- Configuring your card for your display type
- Setting up an extended desktop
- Turning on zoom features
- Activating the ATI Popup Menu

When the ATI Displays control panel is active, access the ATI Guide by clicking the  icon in the ATI Displays control panel.



Installing Your Card

The XCLAIM GA fits into connectors called expansion slots, inside your computer.

Your Macintosh comes with several slots, each designed to accept Peripheral Component Interconnect (PCI) cards.



WARNING

- The manufacturer assumes no liability for any damage, caused directly or indirectly, by improper installation of components by unauthorized service personnel. **If you do not feel comfortable performing the installation, consult a qualified technician.**
- Make sure power is off during installation; otherwise, damage to system components, the graphics accelerator card, and injury to yourself may result.

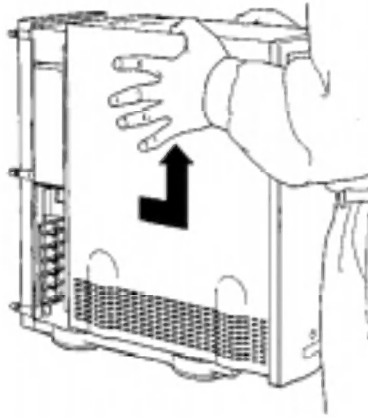


The following procedure details the installation of a card in a typical Macintosh PCI tower. If your system does not match this configuration, please refer to your system user's guide for expansion card installation instructions.

To install your XCLAIM GA:

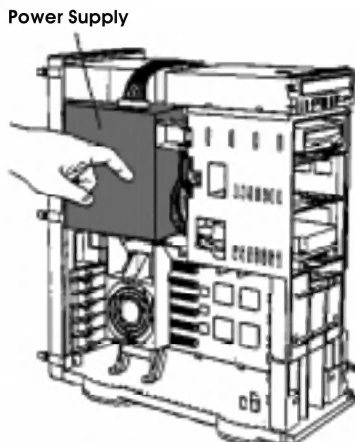
1. **Turn off your computer, and disconnect the monitor cable.**

2. Remove the computer cover. If necessary, consult your computer system manual for removal instructions.

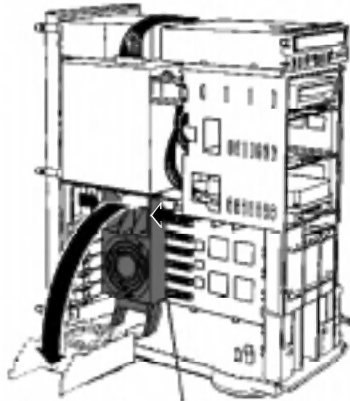


3. Choose the PCI expansion slot you wish to use.
4. Touch the metal part of the power supply case.

Touching the grounded portion of the power supply case will discharge your body's static electricity.



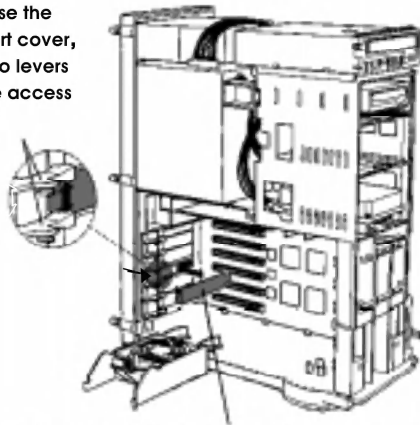
5. Lower the auxiliary fan.



To lower the fan, squeeze the sides to unlatch it.

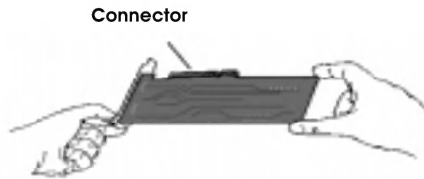
6. Remove the metal access cover from the expansion slot you want to use.

1. To release the access port cover, pull the two levers next to the access port apart

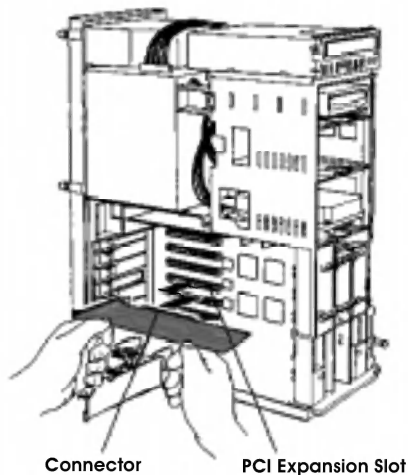


2. Slide the access port cover out and away from the access port.

7. **Align the connector on the card with the PCI expansion slot and press firmly until fully seated.**



Do not force the card; if you encounter excessive resistance, remove the card and try again.

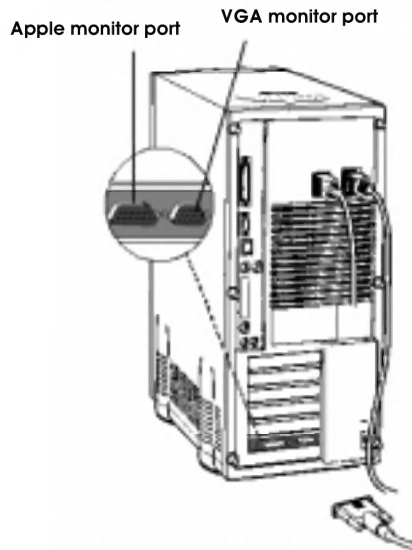


If you plan to use multiple displays, you must install a card for each monitor. Repeat steps 6 and 7 for each display.

8. **Replace the auxiliary fan.**

9. Replace the computer cover.

10. Connect the monitor cable to the card.



If you have an Apple monitor, connect it to the Apple monitor port. If you have a VGA monitor, connect it to the VGA monitor port. **Only connect one monitor to the card.**



WARNING

- Serious damage to your system may occur if you connect more than one monitor to the card. If you have more than one monitor you must connect it to another graphics card.



If your monitor is connected to the Apple monitor port, it must support Apple's "monitor sense" protocol, either directly or through an appropriate adapter. Otherwise, all of the resolutions supported by your monitor will not

be available for selection. For more information, refer to *About Monitor Sensing* below.

Installation of your XCLAIM GA is now complete and you are ready to install the software. Refer to *Chapter 3, Installing Your Software*.

About Monitor Sensing

Apple's "Monitor Sensing" specification allows graphics cards to identify the attached monitor. During startup, the XCLAIM GA checks the status of three of the fifteen pins on the Apple monitor port. It then auto-configures itself according to the monitor sense code detected and enables all resolutions supported by the monitor. Since the XCLAIM GA relies on this sense code to correctly auto-configure during startup, the monitor must supply the appropriate sense code.

In a case where your monitor does not directly supply the sense code information, an adapter can be used to set the appropriate sense code for your monitor. Typically, an adapter is used to connect a VGA monitor to the Apple monitor port, or to simply supply the correct monitor sense code information.



If the adapter supplies the sense code information for only one resolution, then that resolution will be the only one available, even if the monitor supports multiple resolutions. Therefore, when using an adapter to supply the sense code, it must be designed to supply the proper code for the monitor you are using it with; otherwise, the XCLAIM GA cannot correctly auto-configure itself for the attached monitor.



Although the XCLAIM GA card does not output Sync-on-Green (SOG) signals directly, adapters are available that can overlay the Composite Synchronization Signal and send it through the Green video signal line so that you can use an SOG monitor. Monitors requiring an SOG signal usually have only three BNC connectors (RGB).



Installing Your Software

About ATI Software

The XCLAIM GA needs three components installed in your System folder and an online help in the Preferences folder to run. The ATI Installer will do this for you. The following items are installed:



ATI Displays Control Panel

The ATI Displays control panel lets you configure your card and to access software features. These features are described later in this chapter.



ATI Extension

The ATI extension will be placed in your system folder. It provides extra functionality for the ATI Displays control panel.



Graphics Accelerator Extension

The Graphics Accelerator extension is the driver that interacts with your card to provide graphics acceleration.



ATI Guide File

The ATI Guide file is the online help for the ATI Displays control panel. It is placed in the Preferences folder within the System folder.

Installing Software

1. **Insert the ATI Graphics Accelerator Installation disk into your disk drive.**

2. **Double-click on the ATI  Installer icon.**

The ATI splash screen appears.

3. **Click the Continue button.**

An ATI information and disclaimer screen appears.

4. **Click the Continue button.**

A message appears: "The XCLAIM GA software will now be installed into your system. Please restart your system once the process is complete."

5. **Click the Install button.**

A status bar is displayed, followed by the message "Installation was successful".

6. **Click OK.**

The Installer automatically quits. To complete the installation, you must now restart your computer.



ATI Displays Control Panel

The ATI Displays control panel provides access to the various features you need to configure your XCLAIM GA card and to enhance your working environment.

A general description of the features is explained below. For detailed instructions on how to set up and use these features, please refer to the ATI Guide, which can be accessed through the ATI Displays control panel.



Displays

The Displays feature allows you to identify the type of display that is connected to the XCLAIM GA card. If you have more than one XCLAIM GA card in your system, the Displays feature lets you select a monitor type for each.



Monitors

The Monitors feature provides access to the standard Apple Monitors control panel. You can use this panel to select color depths and resolutions, and set up multiple monitors. For more information on this panel refer to the Macintosh Guide that comes with your system.



DeskScape

The DeskScape feature lets you select a desktop size that is larger than your display size, providing you with an extended working area. You can then pan and zoom to view different parts of the desktop.



Hot Keys

The Hot Keys feature lets you define four short-cut keys that will quickly change your working environment.

- The DeskScape On/Off key activates and deactivates the DeskScape mode.
- The Zoom In key magnifies a portion of the desktop.
- The Zoom Out key allows you to see a larger view of the desktop. Objects will appear smaller.
- The Popup Menu key activates a popup menu that lets you instantly change color depths and resolutions while working in other applications.

Multiple Displays

If you have more than one display connected to your system, you can use the ATI Displays control panel to identify and configure each display independently. The ATI Displays control panel will identify all the displays connected to your system but will only configure displays that are connected to XCLAIM GA cards.

Popup Menu

ATI also provides a pop-up menu that allows you to change the color depth and resolution of your desktop without exiting your current application. You activate this menu by holding down a hot key combination while clicking the mouse. The ATI Popup Menu appears where the mouse pointer is currently sitting on the screen; therefore, it will affect the display that you are working on.


256 Grays 256 Colors Thousands ● Millions
640 x 480, 67Hz 832 x 624, 75Hz ● 1024 x 768, 75Hz


ATI Popup Menu

The Popup Menu selections are dependent on your configuration and monitor capabilities; therefore the appearance of the Popup Menu may differ.

ATI Guide

The ATI Guide is the main source of information when you are working with the ATI Displays control panel. It behaves similarly to the Macintosh Guide that comes with your system, providing full coach marked and task assisted instructions.

Access the ATI Guide by clicking on the Apple Guide  icon on the ATI Displays control panel. The ATI Guide stays in front of other windows on the screen so the instructions are always visible. To move the ATI Guide window to another location, drag it by the title bar.

Select a topic from the main ATI Guide window to get detailed instructions for a specific task. To return to the main ATI Guide window, click the  icon in the lower-left corner of the Guide window. When you're finished using ATI Guide, click the close box.

Balloon Help

Balloon Help is also available for the ATI Displays control panel. Turn balloon help on in the usual way. Select Show Balloons from the Guide menu in the menubar.



Video Modes

The video mode table below lists the color depth capabilities for the supported resolutions on the 2MB and 4MB XCLAIM GA cards.

Please consult your monitor's specifications to determine which resolutions are available with your display.

Color depth is measured in bits per pixel (bpp):

- 8 bpp = 256 colors
- 16 bpp = thousands (32,768 colors)
- 32 bpp = millions (16.7 million colors)

Display Type	Display Resolution	Horizontal Refresh kHz	Vertical Refresh Hz	Maximum Colors at 2MB	Maximum Colors at 4MB
21" Color/Two Page	1152x870	68.68	75.06	thousands	millions
19" RGB	1024x768	60.24	74.92	thousands	millions
16" Color	832x624	48.72	74.55	millions	millions
15" RGB Portrait	640x870	68.85	75.00	thousands	millions
13" Color	640x480	35.00	66.66	millions	millions
12" Mono	640x480	35.00	66.66	256	256
15" Multi Scan	640x480	35.00	66.66	millions	millions
15" Multi Scan	832x624	49.72	74.55	millions	millions
17" Multi Scan	640x480	35.00	66.66	millions	millions
17" Multi Scan	832x624	49.72	74.55	millions	millions
17" Multi Scan	1024x768	60.24	74.92	thousands	millions

Display Type	Display Resolution	Horizontal Refresh kHz	Vertical Refresh Hz	Maximum Colors at 2MB	Maximum Colors at 4MB
20" Multi Scan	640x480	35.00	66.66	millions	millions
20" Multi Scan	832x624	49.72	74.55	millions	millions
20" Multi Scan	1024x768	60.24	74.92	thousands	millions
20" Multi Scan	1152x870	68.68	75.06	thousands	millions
20" Multi Scan	1280x1024	79.97	75.02	256	thousands
VGA	640x480	31.46	60	millions	millions
SVGA	800x600	35.15	55.98	millions	millions
VESA	800x600	37.87	60.31	millions	millions
VESA	800x600	48.07	72.18	millions	millions
VESA	800x600	46.87	75.00	millions	millions
VESA	1024x768	48.36	60.00	thousands	millions
VESA	1024x768	56.47	70.00	thousands	millions
VESA	1024x768	60.02	75.00	thousands	millions
VESA	1280x960	75.00	75.00	256	thousands
VESA	1280x1024	64.30	60.02	256	thousands
VESA	1280x1024	80.0	75.03	256	thousands
VESA	1600x1200	78.2	60.00	256	thousands
VESA	1600x1200	87.2	66.66	256	thousands
VESA	1600x1200	95.2	76.00	256	thousands

Memory Upgrade

If you currently have a 2MB XCLAIM GA card, you can upgrade to 4MB by adding a 2MB VRAM upgrade module. A 4MB XCLAIM GA card gives you more color depths in high resolution modes. Please refer to the *Video Modes table* above to determine which resolutions and color depths are available for your monitor with 2MB or 4MB of memory. Please consult your monitor's specifications to determine which resolutions are available with your display.

To obtain a memory module upgrade, please contact your dealer.



Specifications

System Requirements

- Power Macintosh with PCI.

Operating System

- Macintosh System software 7.5.2 or higher.

Graphics Controller

- ATI *mach64* 64-bit graphics and multimedia accelerator chip (ATI-88800GX).

Video Display Buffer

- 2MB VRAM memory (upgradeable to 4MB).
- 64-bit memory interface.

Bus

- 32-bit PCI local bus compliant with PCI version 2.0 specification.

Sync Signals

- Separate horizontal and vertical sync at TTL levels.
- Composite sync at TTL levels.

Video Memory Address

- Supports PCI Multimedia Standard.
- Supports 16MB relocatable memory aperture.

Video Output Connector

- Apple Connector - Apple DB-15
- VGA Connector - Standard VGA

Video Interrupt

- PCI interrupt request enabled; interrupt is auto configured by system.

Power

- +5V +/- 5%, @ 1.3A typical.

Environment

- Ambient Temperature:
50° to 122° F (10° to 50° C) operation.
32° to 162° F (0° to 70° C) storage.
- Relative Humidity:
5% to 90% non-condensing operation.
0% to 95% storage.

MTBF

- 120,000 hours.

EMC Certification

- FCC Class B

Safety

- PCB made from UL-listed flame retardant material.



Troubleshooting Tips

Before Contacting Customer Support

The following troubleshooting tips are a compilation of known problems and frequently-asked questions concerning the XCLAIM GA graphics card. Therefore, if you have a general question, or encounter problems with your card, please review this information completely before contacting Customer Support.

A problem report form can be initiated from the ATI Displays control panel. Please refer to the ATI Guide for instructions on generating this problem report, and for general troubleshooting tips not covered in this section (for more information, refer to *ATI Guide* on page 13).

Before calling about a suspected problem, please complete the problem report, and have the report file either on-screen or printed out for reference during your call. Important information about your system is automatically included when you generate the report.

Solutions to Common Problems

Why can't I get a resolution higher than 640x480?



If the monitor is connected to the VGA monitor port on your XCLAIM GA card...

- go to the ATI Displays control panel, click "Displays", and select a monitor type which matches the specifications of your monitor. This allows more resolutions to be available for selection in the Monitors control panel.



If the monitor is connected to the Apple monitor port on your XCLAIM GA card...

- The problem likely relates to Monitor Sensing (refer to page 8). Any monitor connected to an Apple-type monitor port must supply "sense code information" so that the graphics card can configure itself for the attached monitor. If the detected sense code does not represent the capabilities of your monitor, then the card cannot configure itself properly. You need to attach a monitor adapter that supplies the proper sense code for your monitor. Monitor adapters can be obtained from the monitor manufacturer, or from your local Apple Authorized Dealer.

I am using a monitor adapter to supply the sense code, but I only get one resolution, even though I have a multiscan monitor. Why?

- If the adapter is configurable, you need to adjust it to one of the multiscan options that best matches your monitor. If the adapter is not configurable, you need a new adapter with the proper sense code for a multiscan monitor.

I have a monitor with three BNC connectors. Why won't it work with my XCLAIM GA card?

- Monitors that only have three BNC connectors require a synchronization ("sync") signal to be sent down the green line. This is called Sync-on-Green (SOG). ATI accelerator cards do not output an SOG signal. Adapters are available for your Macintosh to convert the separate sync signal from the ATI card to an SOG signal for the monitor. Check with your local Apple Authorized Dealer for availability of SOG adapters.

I have a monitor with five BNC connectors. Why won't it work with my XCLAIM GA card?

- For a cable with five BNC connectors, ensure that they

are all connected to the monitor. If only three of the cables are connected (i.e., R, G, and B), the monitor is expecting a Sync-on-Green (SOG) signal.

- Some monitors may have a switch to set the monitor to either SOG or separate sync. If the switch is set to SOG, the monitor will show a scrambled display. Setting the switch to separate/composite sync may resolve the problem.
- A number of BNC cables, even though they are designed for Macintosh computers, do not supply the sense code needed by the graphics card. Using an adapter which sets the appropriate sense code should solve the problem.

After selecting a monitor type in the ATI Displays control panel, I couldn't change the resolution in the Available Resolutions window.

- This window in the ATI Displays control panel only shows the available resolutions for the monitor type selected, and will not allow you to select and change resolutions. Changing resolutions can only be done through the Monitors control panel, or by using the Popup Menu supplied with the XCLAIM GA card.

Can the XCLAIM GA work in all Power Macintosh computers?



- No, the XCLAIM GA only works with the newer PCI-based Power Macintosh computers. Current models include the 7200, 7500, 8500, and 9500 systems. The minimum system requirements for the XCLAIM GA are:
 - a) Power Macintosh with PCI expansion slots,
 - b) Macintosh System Software version 7.5.2 or later, and
 - c) A monitor that supports a minimum resolution of 640x480, with a minimum refresh rate of 60Hz.

Where can I get a memory module upgrade for my XCLAIM GA card?

- Memory upgrade modules are available either from your dealer, or they can be purchased directly from ATI Customer Support.

What is the main difference between the *mach64* graphics card bundled with the 9500/120 and the XCLAIM GA card?

- The card bundled with the 9500/120 is a special version, based closely upon the XCLAIM GA. It is built specifically for Apple Computer and does not support the ATI Displays control panel.
- The ATI Displays control panel and the dynamic pan and zoom features are only supported by XCLAIM GA. Other differences are outlined in the following chart:

Features	XCLAIM GA	9500/120
<u>ATI Displays Control Panel:</u>		
Zoom In/Out	yes	no
DeskScape (panning feature)	yes	no
Popup menu	yes	no
ATI Guide	yes	no
<u>Monitor Connectors:</u>		
Apple-type 	yes	yes
VGA-type 	yes	no
<u>Warranty:</u>		
AppleCare one-year warranty	no	yes
ATI five-year warranty	yes	no
<u>Supported Resolutions:</u>		
640x480 to 1280x1024	yes	yes
1600x1200	yes	no
<u>Memory:</u>		
2MB (upgradeable to 4MB)	yes	yes



Regulatory Compliance

FCC Compliance Statement



This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



WARNING

- The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations.
- Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Industry Canada Compliance Statement

ICES-003 This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe B Respecte toutes les exigences du Règlement sur le matériel brouiller du Canada.

CE Compliance Information

EMC Directive 89/336/EEC and Amendment 92/31/EEC,
Class B Digital Device

EN 5008-1, Generic Emissions Standard for Residential, Commercial and Light Industrial Products

(EN 55022/CISPR 22, Limits and Methods of Measurement of Radio Interference Characteristics Information Technology Equipment)

Warning: This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

EN 50082-1, Generic Immunity Standard for Residential, Commercial and Light Industrial Products
(IEC 801-2, IEC 801-3, IEC 801-4)



A

About ATI Software 9
About Monitor Sensing 8
Apple Monitor Port 1, 7, 20
ATI Displays Control Panel 9
ATI Displays Control Panel Features 10
ATI Extension 9
ATI Guide 13, 19
ATI Installer 9

B

Balloon Help 13
Before Contacting Customer Support 19

C

Color Depth 12, 15
Common Problems 19

D

DeskScape Feature 11
Displays Feature 11

G

Getting Started
 What You'll Need 2
 What's in the Package 2
Graphics Accelerator extension 9
Graphics Controller 17

H

Help 13
Hot Keys Feature 12

I

Installing Your Card 3
Installing Your Software 9

M

Monitor Type 11, 19
Monitors Feature 11
Multiple Displays 6, 12

P

PCI expansion slot 4, 6
PCI local bus 1, 17
Peripheral Component Interconnect (PCI) 3
Popup Menu 12
Popup Menu key 12

R

Resolution 12, 19

S

Specifications 17
Supported Resolutions 15
Sync Signals 17, 20
System Requirements 17, 21

T

Troubleshooting Tips 19

V

VGA Monitor Port 1, 7, 19
Video Display Buffer 17
Video Interrupt 18
Video Memory Address 17
Video Modes 15
Video Output Connectors 18
VRAM upgrade module 16, 22

Z

Zoom In Key 12
Zoom Out Key 12